# Cross-Cascades Corridor Study Model Development

## Peer Review Session

Friday, June 1, 2001

PSRC Conference Room

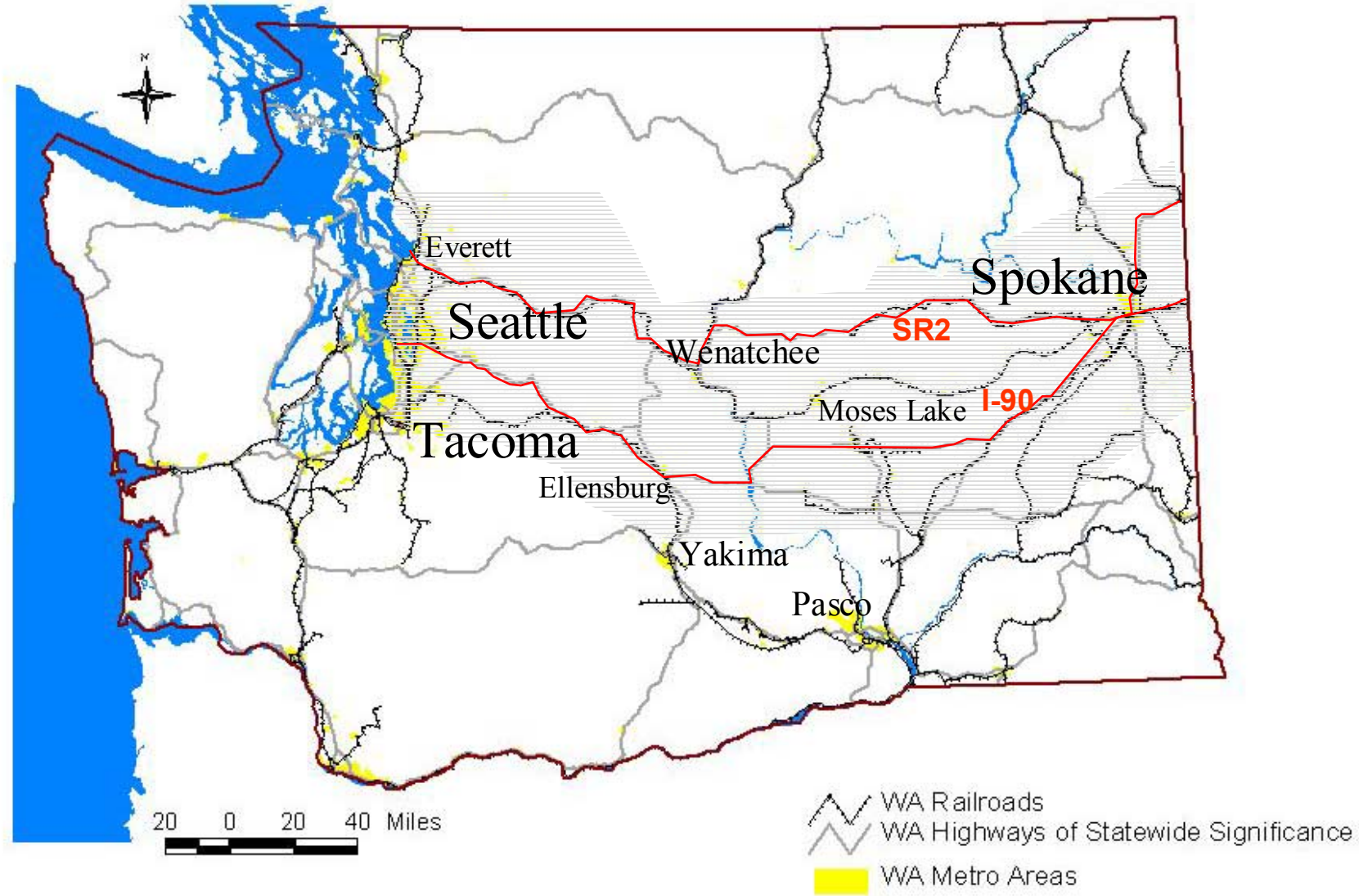
# Agenda

| | | |
|---|---|---|
| **Welcome and Introductions** | F. Al-Memar/N. Boyd<br>S. Garber | 9:30-9:40AM |
| **Purpose of Peer Review Session** | S. Garber | 9:40-9:50AM |
| **Study Background and Context** | M. Ford | 9:50-10:10AM |
| ***Q1*: The Model Structure**<br>Choice of Spatial Input-Output<br>Model Approach<br>The Land Use Model<br>The Transportation Model<br>The Interface Model | J.D. Hunt, T. Weidner | 10:10-Noon |
| **LUNCH** | | **Noon-12:45PM** |
| ***Q2*: Calibration & Model Outputs** | J. Abraham, T. Weidner | 12:45-1:30PM |
| ***Q3*: Future Scenarios** | S. Garber | 1:30-1:45PM |
| **Q4: Priorities for Future Model Development/Next Steps** | M. Ford | 1:45-2:30PM |
| **Other Remarks** | Peer Reviewers | 2:30-3:15PM |
| **Wrap up** | M. Ford | 3:15-3:30PM |

# Objective

*To provide an independent critical assessment of the model approach, data, analytic methods and assumptions being advanced by the consultant team for the development of an interregional travel forecasting tool. In addition to evaluating the architecture, capabilities, and data needs of the model, the Peer Reviewers will assess the proposed outputs, scenarios, and overall usage of the Cross Cascades Corridor model, and will be asked to provide guidance on the next steps of the model development process.*

# WA Cross Cascades Corridor



# Study Background and Context

- Project Purposes
  - Tool to forecast and analyze travel demand
  - Statewide corridor plan to support WTP
  - Statewide corridor planning process as “template” for future analysis.
- Deliverables
  - Method to analyze statewide multimodal corridors
  - Corridor development plan

# Study Background and Context

With selection of Spatial I-O approach project evolved toward development and demonstration of method for corridor analysis

Away from corridor plan *per se*

# Model Criteria

- It must be capable of analyzing and estimating demand for ***highway, rail, and air modes.***
- It must be capable of producing ***interregional forecasts and analyses*** across the full length of the corridor.
- It must have the capability to directly ***integrate output from other forecast models*** in use along the corridor.
- The forecast model developed for the Cross Cascades Corridor must be ***applicable and transferable*** to other corridors, and be "expandable" for eventual use in analyzing the entire state highway system, as well as other transportation facilities and services of statewide significance (as specified in RCW 46.06.140).

# Model Criteria

- It must be capable of providing ***6-year and 20-year forecasts***.
- It must utilize the ***WTP policy framework*** as the principal criterion and scenarios for analysis, with an emphasis on highway congestion relief.
- It must be capable of ***producing output in GIS*** or other "visually-friendly" and meaningful format.
- It must be *simple to operate, modify and update* by WSDOT staff.
- And finally, something must be ***developed within 16 weeks to demonstrate the model on the CCC project.***

# Candidate Model Approaches

- Traditional Four-Step Traffic Model
- Trip Tables generated using Maximum Entropy
- Spatial Input-Output
- Micro Simulation
- Linear Programming

# Advantages of the Spatial Input-Output Approach

- Incorporates Land Use
- Dynamic
- Expandable and transferable
- Can borrow data from other sources
- Can build rudimentary model in 12 weeks

# Model Development Timeline

| WSDOT Cross-Cascades Corridor Modeling Task | | February | | | | March | | | | April | | | | | May | | | | June | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5 | 12 | 19 | 26 | 5 | 12 | 19 | 26 | 2 | 9 | 16 | 23 | 30 | 7 | 14 | 21 | 28 | 4 | 11 | 18 |
| | Week | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 1 | Develop Model Specification | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| 2 | Develop Baseline Model Networks (base & future years) | Data Collection/Processing | | | | | | | | | | | | | | | | | | | |
| 3 | Develop Zone System and data | | | | | | | | | | | | | | | | | | | | |
| | Develop Highway O-D Trip Table for Phase 2 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| 4 | Develop Assignment and Route Choice Functions | | | | | | | Build Components | | | | | | | Fine-Tune | | | | | | |
| 5 | Develop Mode Split Functions | | | | | | | | | | | | | | | | | | | | |
| 6 | Develop Land Use Model | | | | | | | | | | | | | | | | | | | | |
| 7 | Trade-to-Trip Conversion Model (Generation Model) | | | | | | | | | | | | | | | | | | | | |
| 8 | Establish Exogenous Travel Demand ("Through" Trips) | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| 9 | Establish consistent interaction for base year | | | | | | | | | | Match Base Year | | | | | | | | | | |
| 10 | Develop Incremental Models (3 year steps) | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| 11 | Meetings | | | | | | X | | | | | | | | | | | Peer | | | |
| 12 | Develop Documentation | | | | | | | | | | | | | | | | | | | | |
| 13 | Training of WashDoT Staff | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| Phase II | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

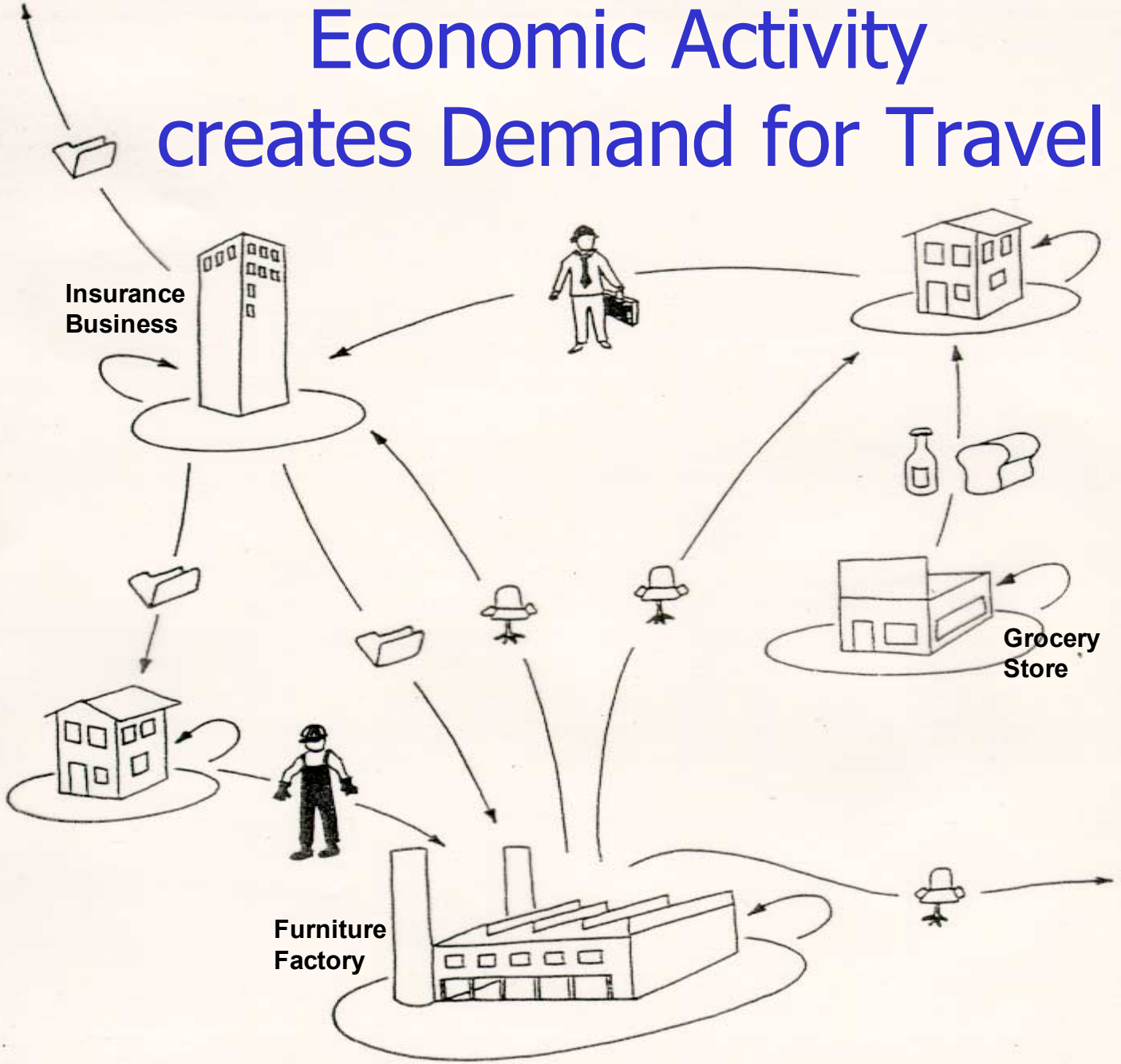
# Question 1

## Model Structure and Data Sources

# Cross Cascades Corridor Modeling Process

- Framework and Design Diagram
- MEPLAN
- Land Use and Economic Data
- Transport Networks and Costs
- Interface Model

# Economic Activity creates Demand for Travel



## ECONOMIC FLOWS (Z-Z)

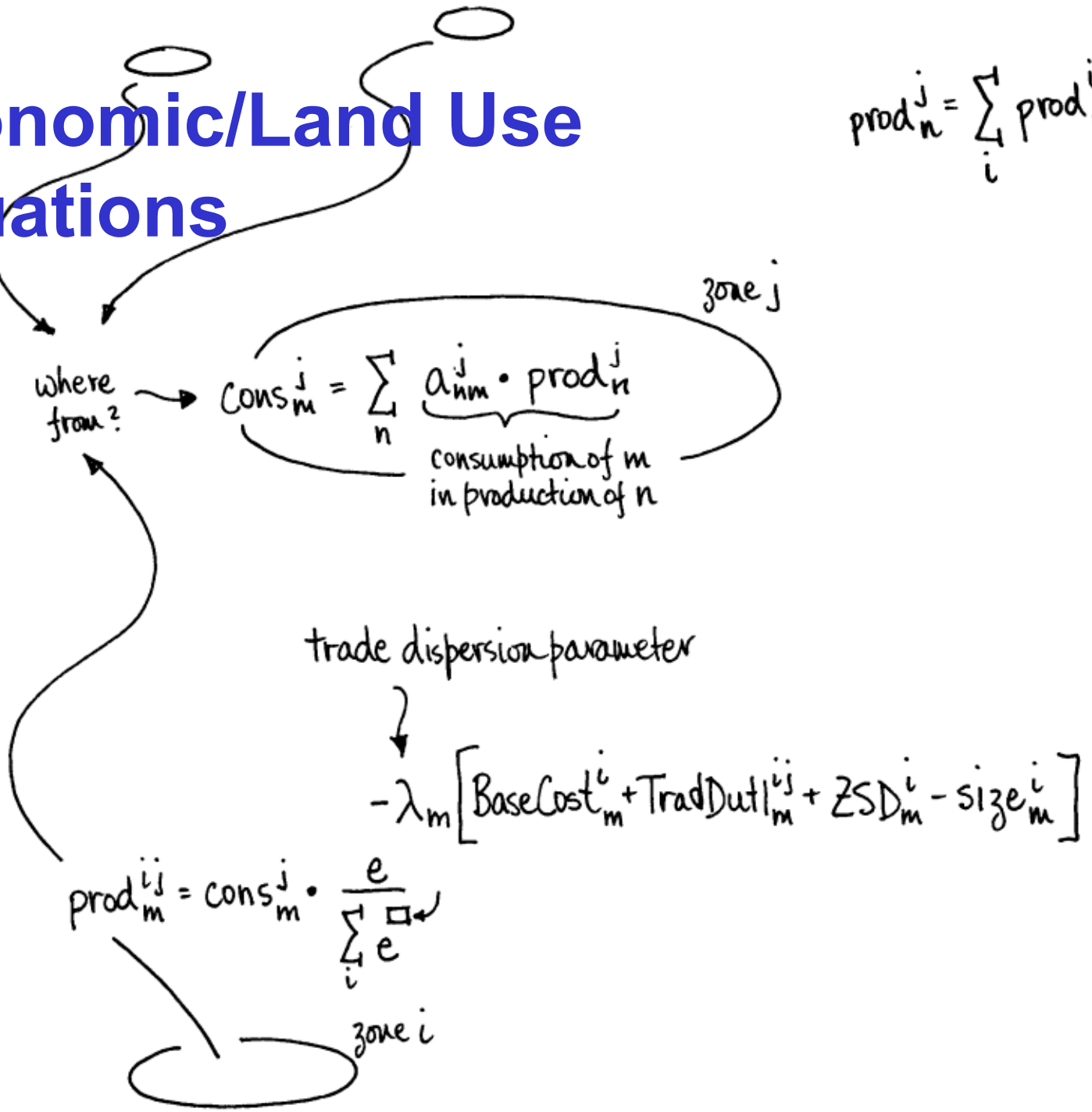
| CONSUMING SECTORS | PRODUCING SECTORS (Note Re-Orientation) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Industries | | | | | | | | | | | | Households | | | Land | | | |
| | AGFF | CONS | OMFG | WOOD | PRNT | TECH | TCPU | WLSE | RETL | FIRE | SERV | GOVT | HH_Lo | HH_Mi | HH_Hi | IND | COM | UrbRES | RurRES |
| **Industries** | | | | | | | | | | | | | | | | | | | |
| AGFF | f | f | f | f | f | f | f | f | f | f | f | f | f | f | f | | | | |
| CONS | f | f | f | f | f | f | f | f | f | f | f | f | f | f | f | e | | | |
| OMFG | f | f | f | f | f | f | f | f | f | f | f | f | f | f | f | e | | | |
| WOOD | f | f | f | f | f | f | f | f | f | f | f | f | f | f | f | e | | | |
| PRNT | f | f | f | f | f | f | f | f | f | f | f | f | f | f | f | e | | | |
| TECH | f | f | f | f | f | f | f | f | f | f | f | f | f | f | f | e | e | | |
| TCPU | f | f | f | f | f | f | f | f | f | f | f | f | f | f | f | e | e | | |
| WLSE | f | f | f | f | f | f | f | f | f | f | f | f | f | f | f | e | e | | |
| RETL | f | f | f | f | f | f | f | f | f | f | f | f | f | f | f | | e | | |
| FIRE | f | f | f | f | f | f | f | f | f | f | f | f | f | f | f | | e | | |
| SERV | f | f | f | f | f | f | f | f | f | f | f | f | f | f | f | | e | | |
| GOVT | f | f | f | f | f | f | f | f | f | f | f | f | f | f | f | | e | | |
| **Households** | | | | | | | | | | | | | | | | | | | |
| HH_Lo | f | f | f | f | f | f | f | f | f | f | f | f | | | | | | e | e |
| HH_Mi | f | f | f | f | f | f | f | f | f | f | f | f | | | | | | e | e |
| HH_Hi | f | f | f | f | f | f | f | f | f | f | f | f | | | | | | e | e |

## TRANSPORT FLOWS (Z-Z)

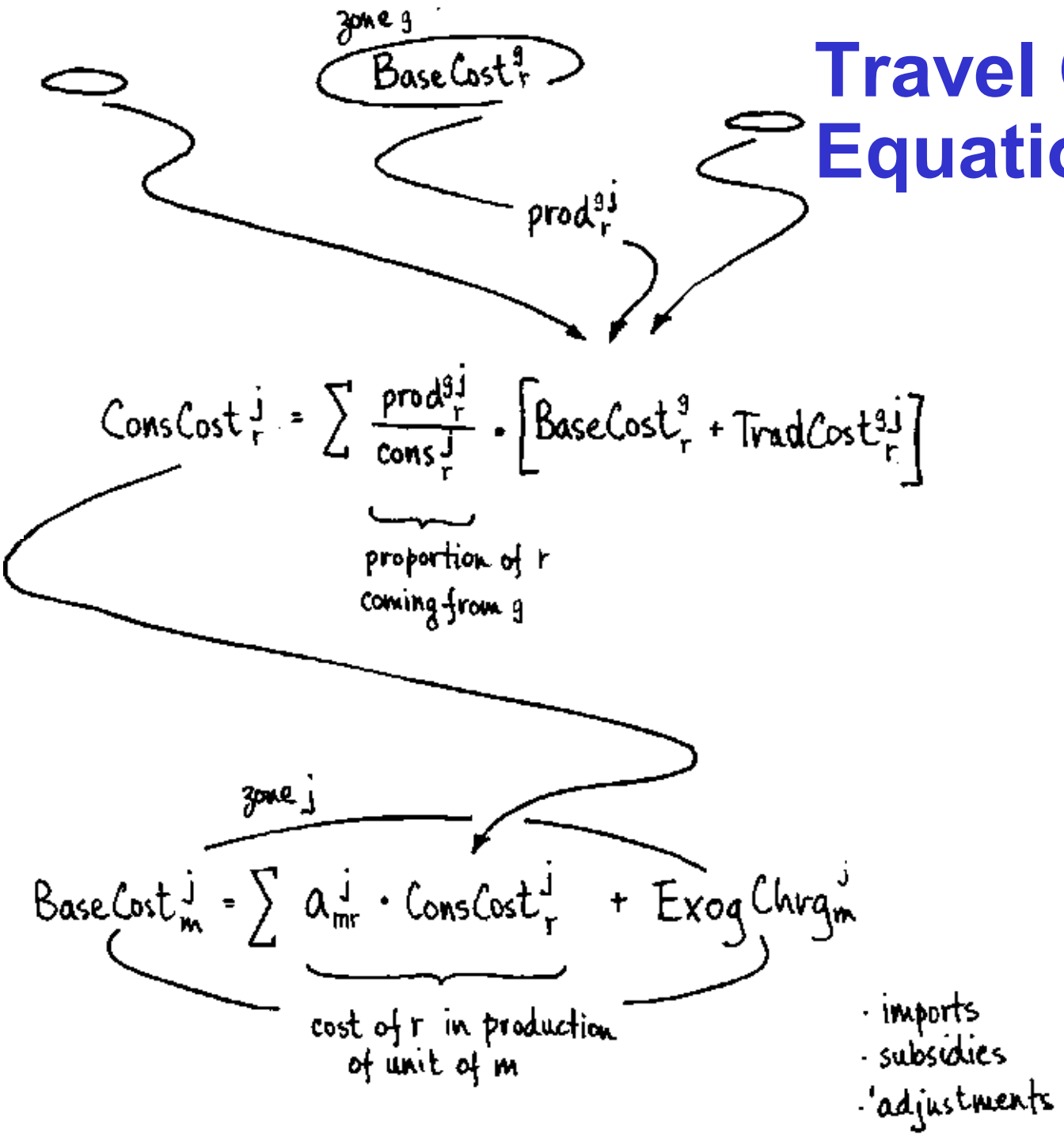
| Transport Categories | Industries | | | | | | | | | | | | Households | | | | MODES | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AGFF | CONS | OMFG | WOOD | PRNT | TECH | TCPU | WLSE | RETL | FIRE | SERV | GOVT | HHIncLo | HHIncMi | HHIncHi | | Passeng | Freight |
| CmuteLo | | | | | | | | | | | | | 1 | | | | 1 | |
| CmuteMid | | | | | | | | | | | | | | 2 | | → | 1 | |
| CmuteHi | | | | | | | | | | | | | | | 3 | | 1 | |
| Recreation | 4 | | | | | | | | 4 | | 4 | 4 | | | | → | 1 | |
| HBOther | | | | | | | | | 5 | 5 | 5 | 5 | | | | | 1 | |
| NHBOther | | | | | | | | | 6 | 6 | 6 | 6 | | | | → | 1 | |
| NHBWork | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | 1 | |
| VisitorBus | | | | | | | | | | | | | | | | → | 1 | |
| VisitorOth | | | | | | | | | | | | | | | | | 1 | |
| Freight | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | → | | 2 |

# Economic/Land Use Equations

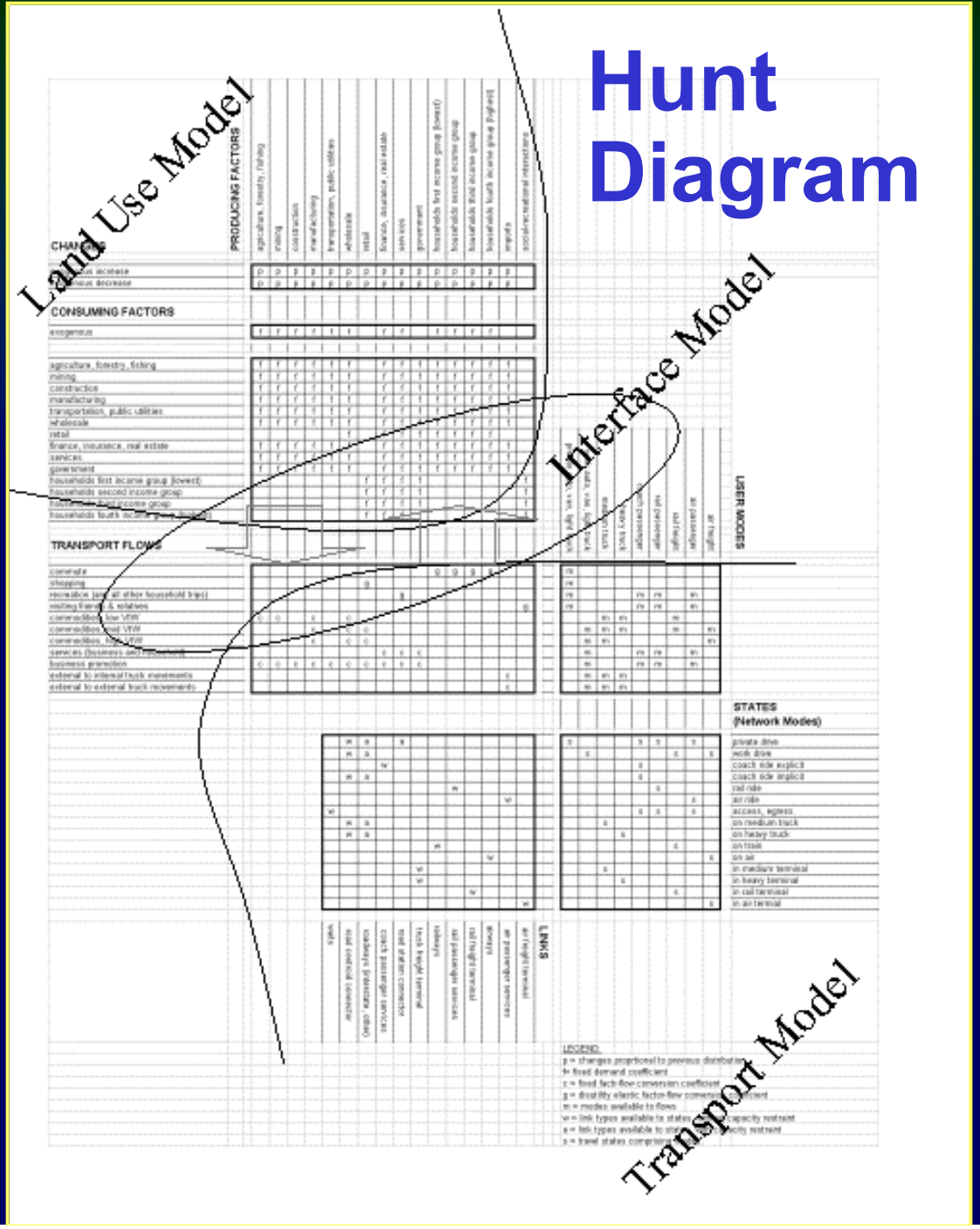
$$prod_n^j = \sum_i prod_n^{ij}$$



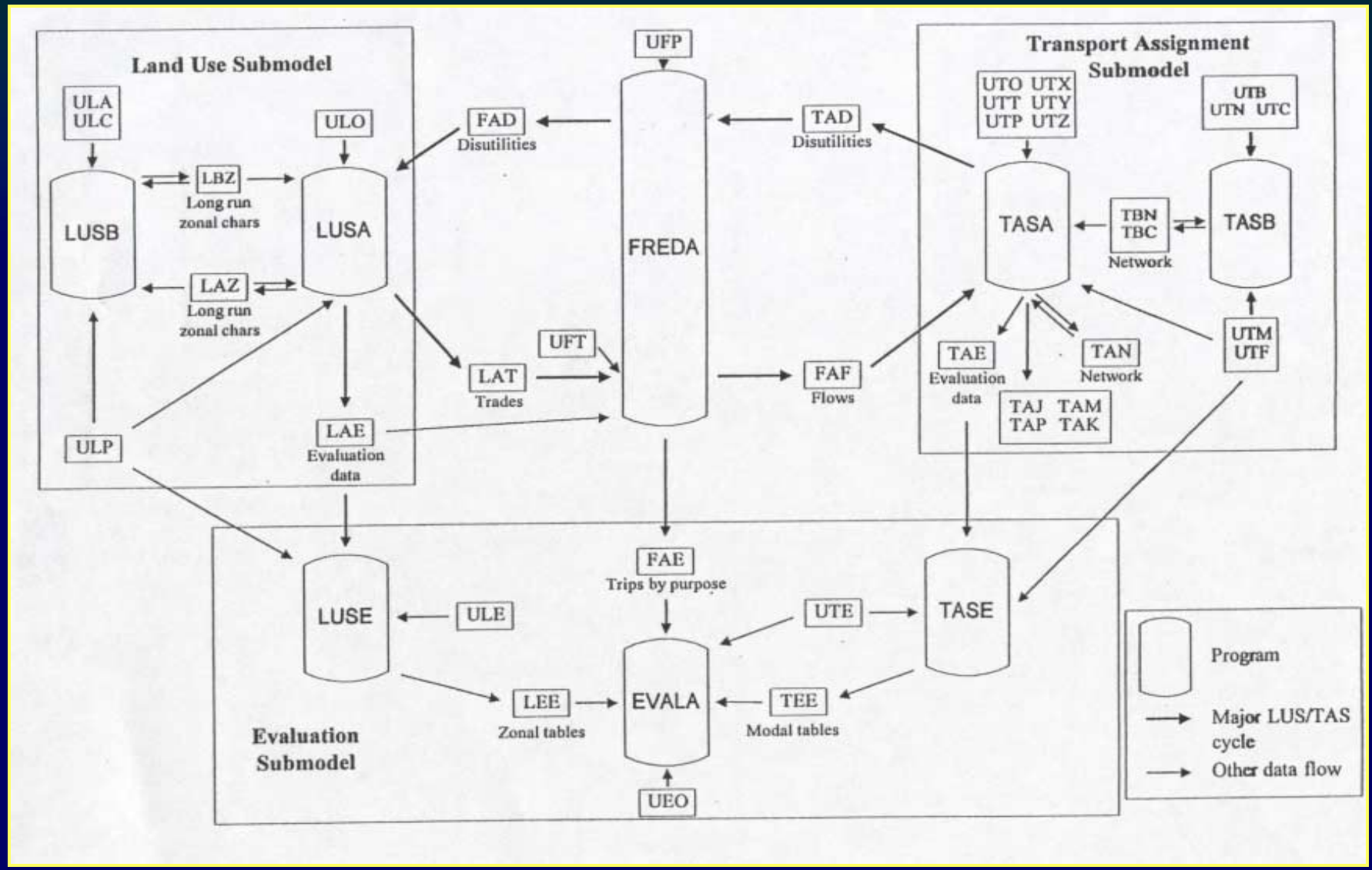
# Travel Cost Equations



# Hunt Diagram



# MEPLAN Model

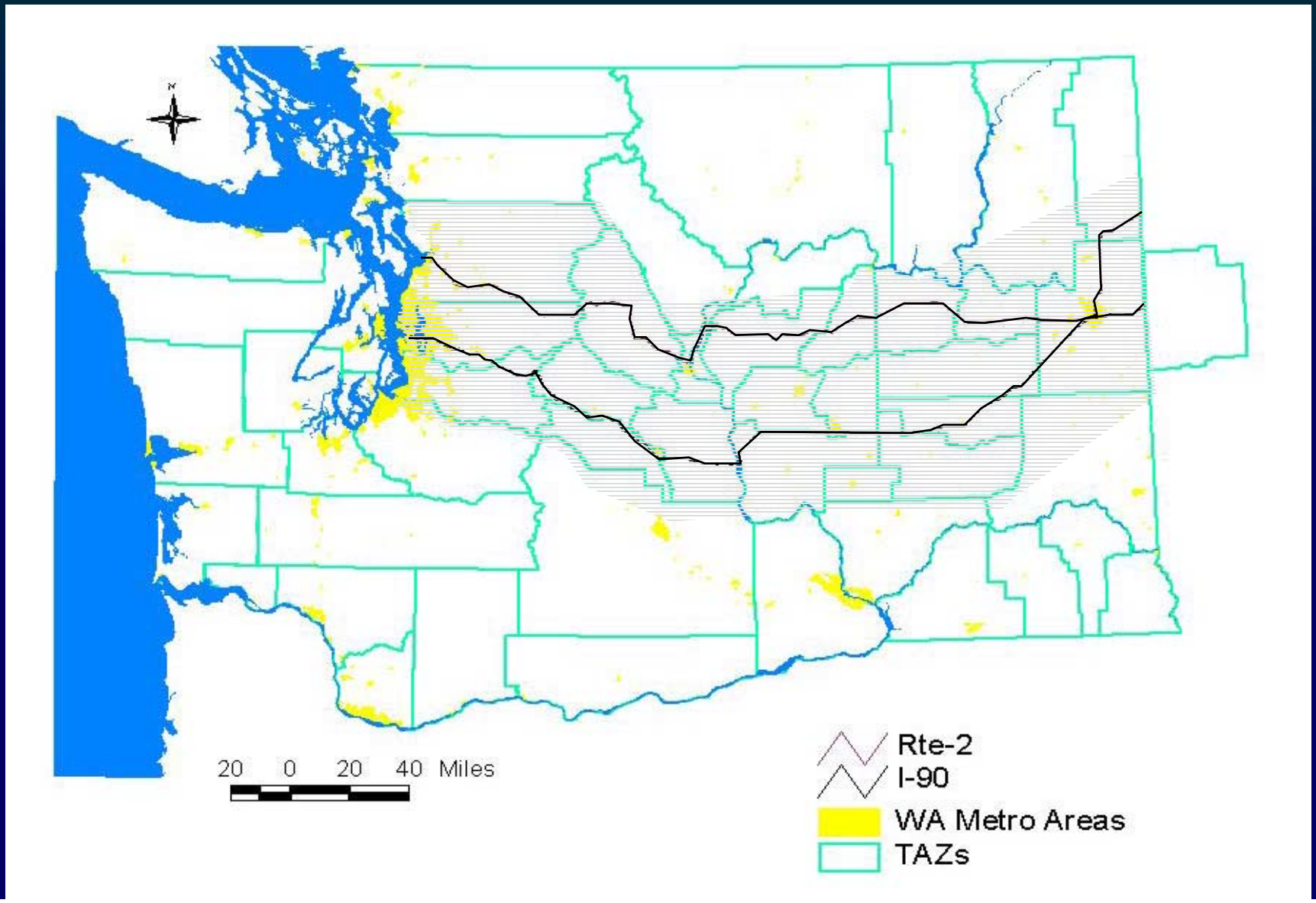


# 1a. Land Use/Economic Model

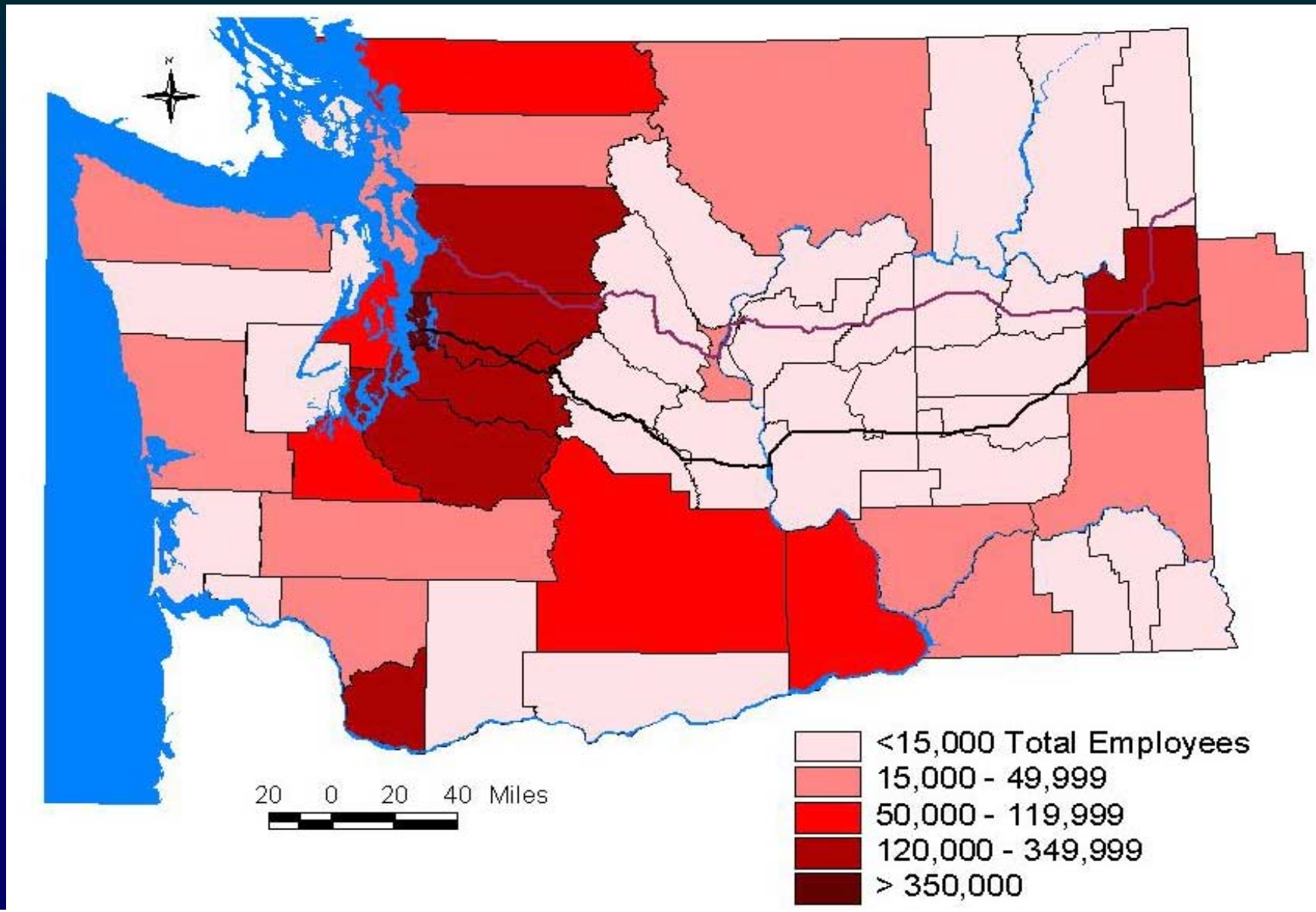
# Land Use Model Data

- Factors/Demographic Data
  - 10 Industry Groups- WA LMEA 1998 Employment
  - 4 Household Income Groups - WA LMEA 1998 Population, average HH size, 1990 Census income split
- 61 Zones
  - Internal: 54 in WA, 1 in Idaho
  - External: 3 to cover US, 2 in Canada, 1 overseas
- Economic Coefficients
  - IMPLAN balanced WA Input-Output Matrix
  - Trade flows converted from dollars to employees or households
  - Exogenous Production, statewide from I-O manipulation, allocated to zones based on employment and 1990 census "not in workforce" data

# CCC Model TAZs



# WA Employment by Zone



# Exogenous Production

- **Exogenous Employment**: Employment serving demand from outside WA
- **Exogenous Households:** Households not dependant on WA jobs for income
- Base Year Exogenous production
  - Statewide Levels from I-O manipulation,
  - Allocated to zones based on:
    - "Special" concentrated Exogenous Production Employment, with remainder by Employment distribution
    - Exogenous Households allocated using 1990 census "not in workforce" data
- Future Year Exogenous production
  - Growth assumed to match WA LMEA statewide growth by industry/household factor

# CCC Exogenous Production

| Factor | Total | Exogenous | % Exog |
|---|---|---|---|
| Agriculture | 122,398 | 97,432 | 80% |
| Mining | 3,380 | 282 | 8% |
| Construction | 155,869 | 42,289 | 27% |
| Manufacturing | 407,455 | 185,695 | 46% |
| TCPU | 145,334 | 59,150 | 41% |
| Wholesale Trade | 163,227 | 15,759 | 10% |
| Retail Trade | 506,920 | 28,023 | 6% |
| FIRE | 143,288 | 47,205 | 33% |
| Services | 761,001 | 233,870 | 31% |
| Gov't | 501,340 | 229,043 | 46% |
| ($0-15k)HH Income* | 640,496 | 340,219 | 53% |
| ($15-30k)HH Income* | 544,471 | 127,394 | 23% |
| ($30-50k)HH Income* | 692,507 | 84,940 | 12% |
| ($50+)HH Income* | 595,022 | 54,754 | 9% |
| Imports | - | 16,160 | |

# 1b. Transport Model

# Flow Types

- 4 Personal passenger (commuter, shopping, visit friends & relatives, and recreation/other),
- 2 Business passenger (services and business promotion),
- 3 Freight (low, med, high Value to Weight),
  - Low Value/Weight = < $3000 per ton
  - Med Value/Weight = $3001-5000 per ton
  - High Value/Weight = > $5000 per ton
- 2 External truck trip types (external-external, external-internal)

# User Modes

- Air freight
- Rail freight
- Heavy truck freight
- Medium truck freight
- Air passenger
- Amtrak (rail passenger)
- Coach (bus passenger)
- Private auto
- Work auto

# Passenger Fares

| Mode | Terminal Cost | Minimum | Constant | Distance Rate ($/person-mile) |
|---|---|---|---|---|
| Coach | NA | $5 | $5.53 | $0.0874 |
| Amtrak | NA | $5 | $5.47 | $0.1348 |
| Air Passenger | All<br>SEA<br>GEG<br>Externals | $40 | $54.68<br>-$22.51<br>-$11.32<br>+$33.88 | $0.0777 |

- $15.00/hour personal value of time

# Freight Rates

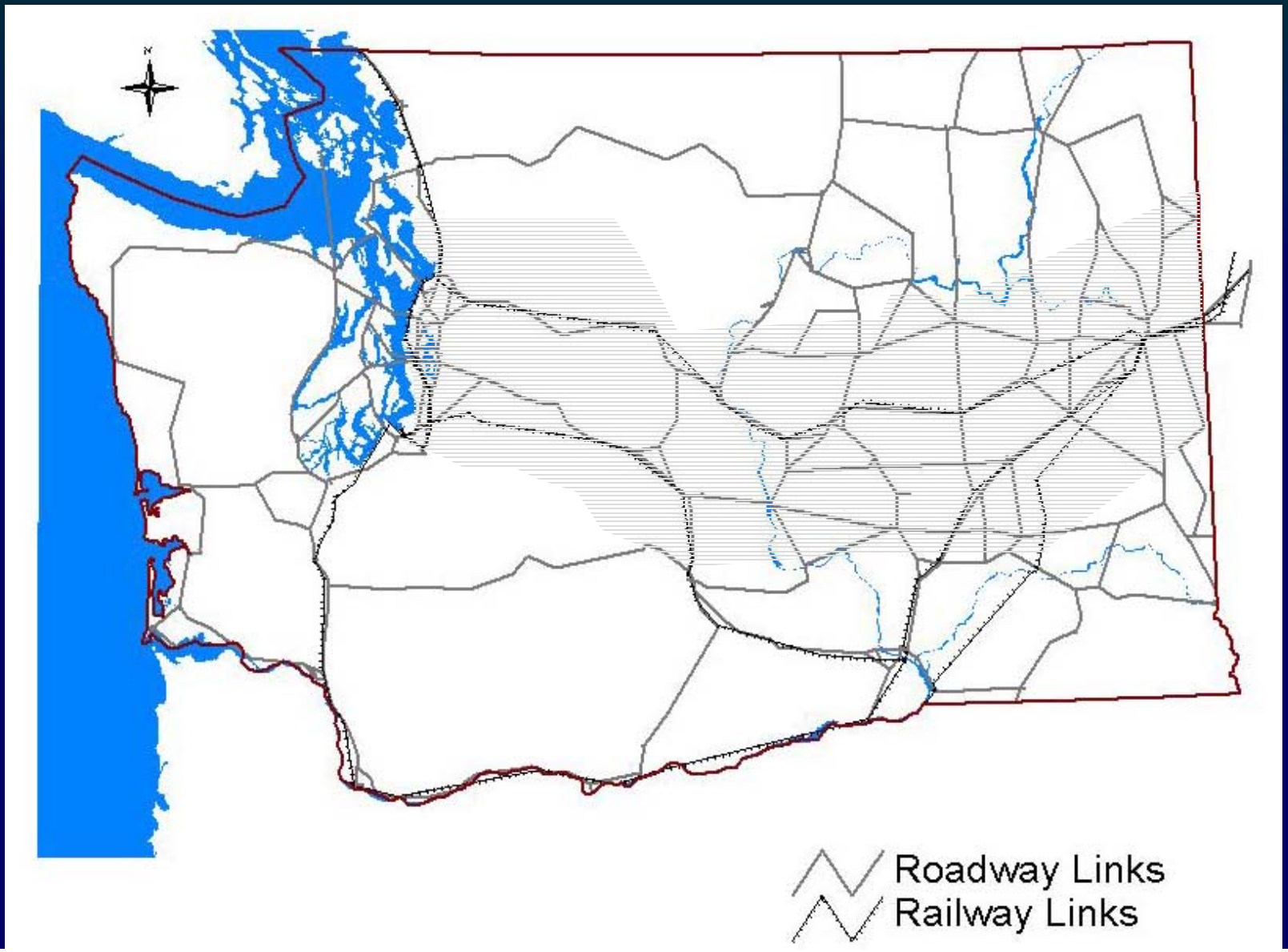
| | | *Distance Rate ($/ton-mile)* | |
|---|---|---|---|
| **Mode** | **Terminal Cost** | **Range (Including terminal costs)** | **Assumed** |
| **Work Drive/Light Truck** | $0 | $0.04 - $0.10/ton-mile<br>$1.25-2.50/mile | $0.10 |
| Medium Truck | $20.50 | | $0.08 |
| Heavy Truck | $25.63 | | $0.10 |
| Rail Freight | $37.50 | $0.02 - $0.04/ton-mile<br>$2.20-2.73/mile | $0.03 |
| Air Freight | $70.00 | $4.90-7.50/ton-mile | $3.00 |

- ·$18.80/hour work drive
- ·$16.50/hour commercial driver

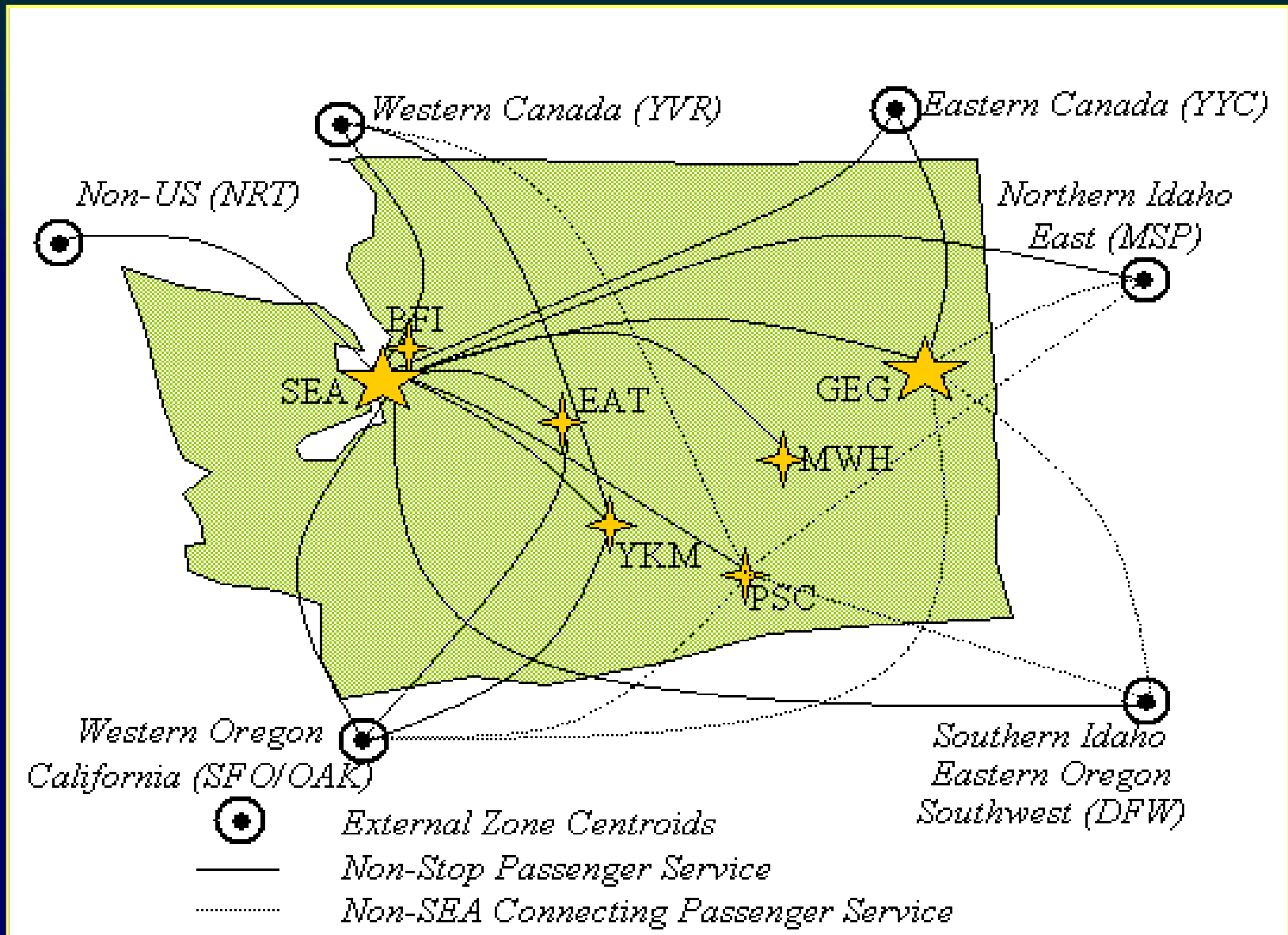
# Transportation Networks

- Base Networks (length, speed, capacity)
  - Highways (BPR capacity restraint function)
  - Airways (no capacity restriction)
  - Railways (no capacity restriction, but congested times used)
- Transit Services (route, headway, frequency)
  - Coach (Greyhound & Northwest Trailways)
  - Amtrak
  - Air Passenger

# 1998 Road-Rail Links



# 1998 Airways Network



| User Mode | | Nodes/Link Types |
|---|---|---|
| 1 | Private Auto | Roadways (interstate, other)<br>Road Centroid Connector |
| 2 | Work Auto/Light Truck | |
| 3 | Medium Truck | Roadways (interstate, other)<br>Roadways (other)<br>Truck Terminal |
| 4 | Heavy Truck<br>(one-way links improve accuracy of intrazonal trip lengths) | |
| 5 | Coach Passenger<br>(Implicit coach runs directly on roadways outside of corridor) | Coach Service<br>Wait<br>Roadways (interstate, other)<br>Road Centroid Connector |
| 6 | Rail Passenger | Rail Passenger Service<br>Wait<br>Railways<br>Road Station Connector<br>Roadways (interstate, other)<br>Road Centroid Connector |
| 7 | Rail Freight<br>(assumes light truck trip to rail terminal) | Railways<br>Rail Freight Terminal<br>Roadways (interstate, other)<br>Road Centroid Connector |
| 8 | Air Passenger | Air Passenger Service<br>Wait<br>Airways<br>Road Station Connector<br>Roadways (interstate, other)<br>Road Centroid Connector |
| 9 | Air Freight<br>(assumes light truck trip to airport) | Airways<br>Air Freight Terminal<br>Roadways (interstate, other)<br>Road Centroid Connector |

# 1c. Interface Model

# Trip Rates

| | Person Trips/HH | |
|---|---|---|
| | **Annual** | **Daily** |
| Commute | 676 | 2.551 |
| Shopping | 775 | 2.925 |
| Visit Friends and Relatives | 314 | 1.185 |
| Recreation and Other (pop attracted) | 983 | 3.709 |
| Services | 1060 | 4.000 |
| Business Promotion | 20 | 0.075 |
| Total | 3828 | 14.445 |

| | | **Ag** | **Mining** | **Man.** | **TCPU** |
|---|---|---|---|---|---|
| **1997 I-E/I-I Tons** | | **1** | **2** | **3** | **4** |
| **Value/Weight** | **L** | 9,265,423 | 10,820,524 | 77,089,686 | 35,423,068 |
| | **M** | 203,008 | 0 | 49,939,463 | 3,877,568 |
| | **H** | 0 | 0 | 5,586,221 | 45,346,426 |
| | | | | | |
| **1998 Employees** | | 122,398 | 3,380 | 407,455 | 145,334 |
| **Tons/Employee** | | 77.36 | 3,201.40 | 325.45 | 270.73 |

**Retail & Wholesale: 464 tons/employee**
**E-E Truck Trips:** 322 tons/$M Imports
E-I Truck Trips: 2,116 tons/$M Imports

# Vehicle Loads

| User Mode | Flow | Tons/Vehicle |
|---|---|---|
| Light Truck | Mid Value/Weight | 3.60 |
| | High Value/Weight | 3.41 |
| Medium Truck | Low Value/Weight | 15.50 |
| | Mid Value/Weight | 14.41 |
| | High Value/Weight | 13.64 |
| Heavy Truck | Low Value/Weight | 25.92 |
| | Mid Value/Weight | 24.02 |
| Freight Rail | Low Value/Weight | 75.95 |
| | Mid Value/Weight | 68.23 |

| Transport Flow | Persons/Vehicle | Assumptions |
|---|---|---|
| Commute | 1.14 | PSRC |
| Shopping | 1.42 | PSRC |
| Recreation/Other | 1.92 | Shopping +0.5 |
| Visiting Friends/Relatives | 2.42 | Shopping +1.0 |
| Services | 1.28 | Ave(commute, shopping) |
| Business Promotion | 1.28 | Ave(commute, shopping) |
| Coach Bus | 22* | 55 seats* 60%LF |

# Question 1: Model Structure/Assumptions

**Please comment on the model structure used in the CCC Project. How will the model assumptions impact reasonableness of outcomes and future model usage?**

- Spatial I-O vs. other model approaches
- Static Data: Network Zones/Transportation Networks
- Behavioral/Operational Data: I-O data, Trip rates, Transportation costs, other

# Question 2: Calibration Process and Initial Model Outputs

# Calibration

- **Model Parameters**
  - Dispersion Parameters (Land Use Model)
  - Mode specific constants (Transport Model)
  - Mode Choice Parameter (Transport Model)
- General Categories of Model Targets (Passenger & Freight)
  - Trip Length Distributions
  - Mode Splits
  - O-D Trip Tables
  - Link Volumes
  - Elasticities

# Specific CCC Model Targets

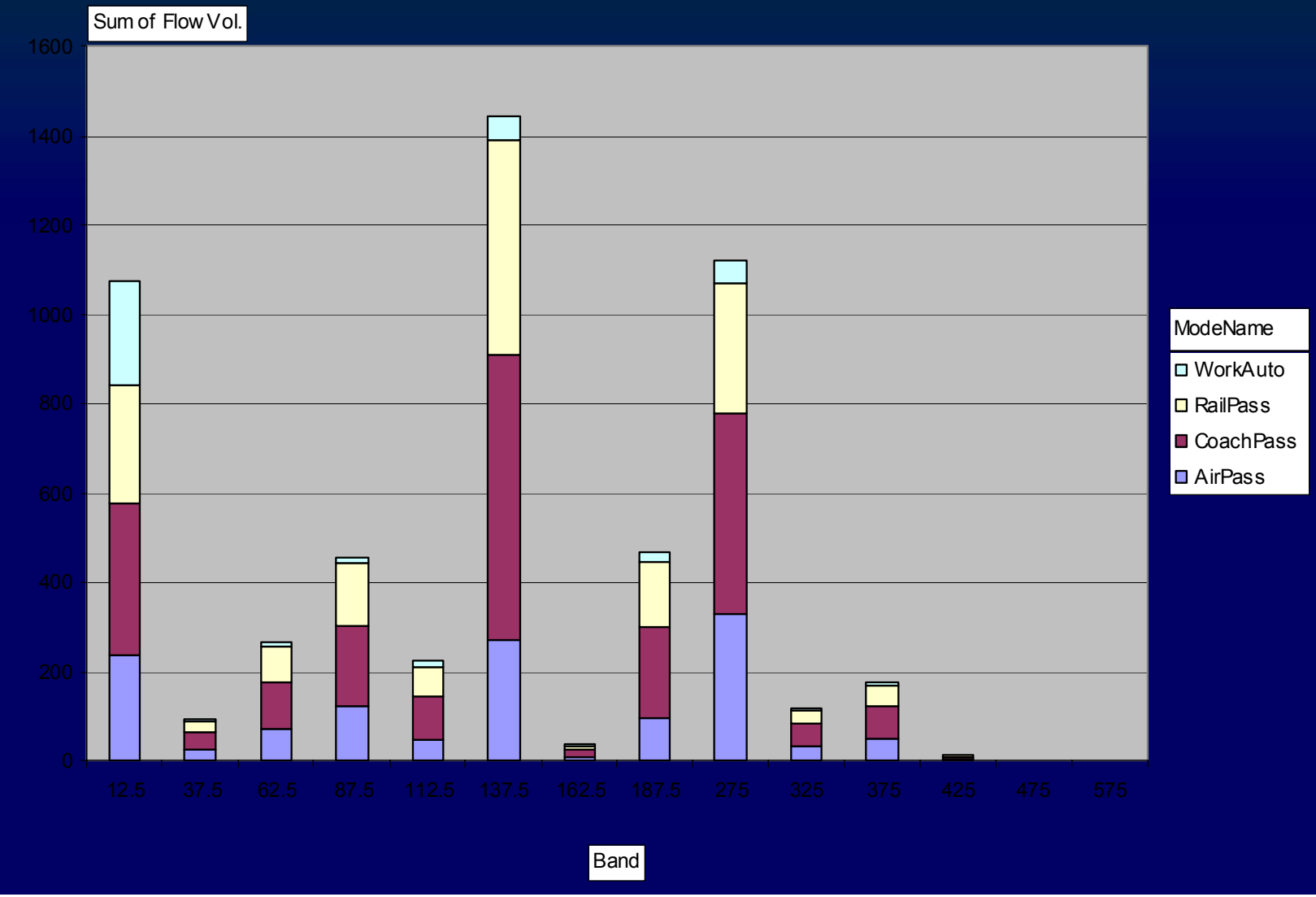
- For person trips:
  - 1995 NPTS-WA State trips and trip lengths
  - 1995 ATS - WA State trips (>100 miles) and trip lengths
  - 2000 Horizon Air WA State O-D passenger data
  - 2000 Greyhound WA State O-D ridership (partial)
  - 2000 Northwest Trailways O-D ridership (selected destinations)
  - WA Airport Activity Statistics for enplaned/deplaned passengers
  - 1999 Amtrak WA State Station on/off passenger data
- For freight flows:
  - 1997 Reebie TRANSEARCH O-D flows (tons)
  - WA Airport Activity Statistics Cargo tonnage enplaned/deplaned

# Specific CCC Model Targets
*continued*

- For network volumes:
  - Synthesized highway O-D from Washington traffic counts
  - Travel Delay Methodology Highway link AADT
  - 1996 WA State Freight Rail Study ton-miles/mile by rail segment
  - MPO congested travel time between their external zones
- Other:
  - Future year WA county-level population
  - WA Gas price elasticity

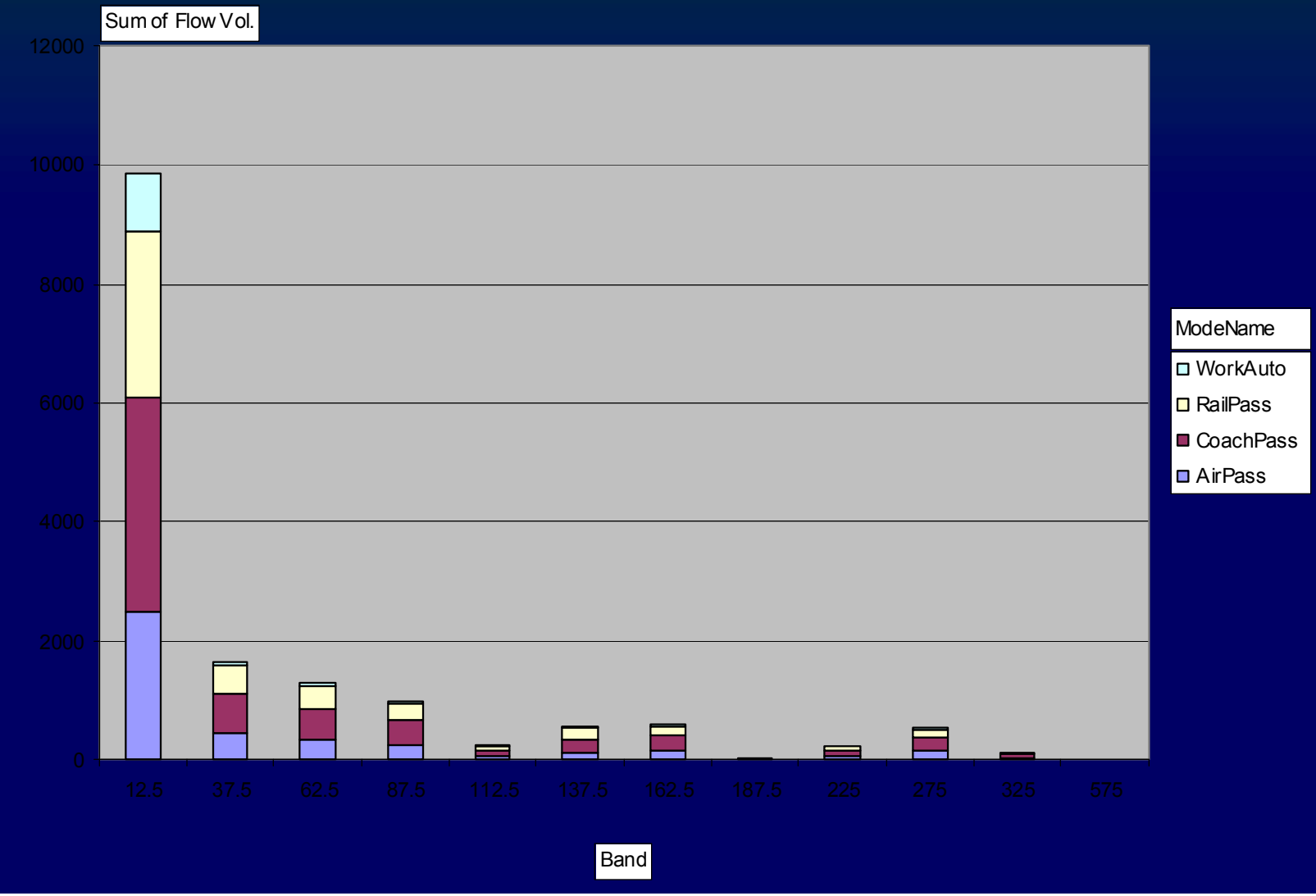
# Mode & Distance of Spokane Business Promo Trips

OrigName | Spokane | Flow Name | BizPromo



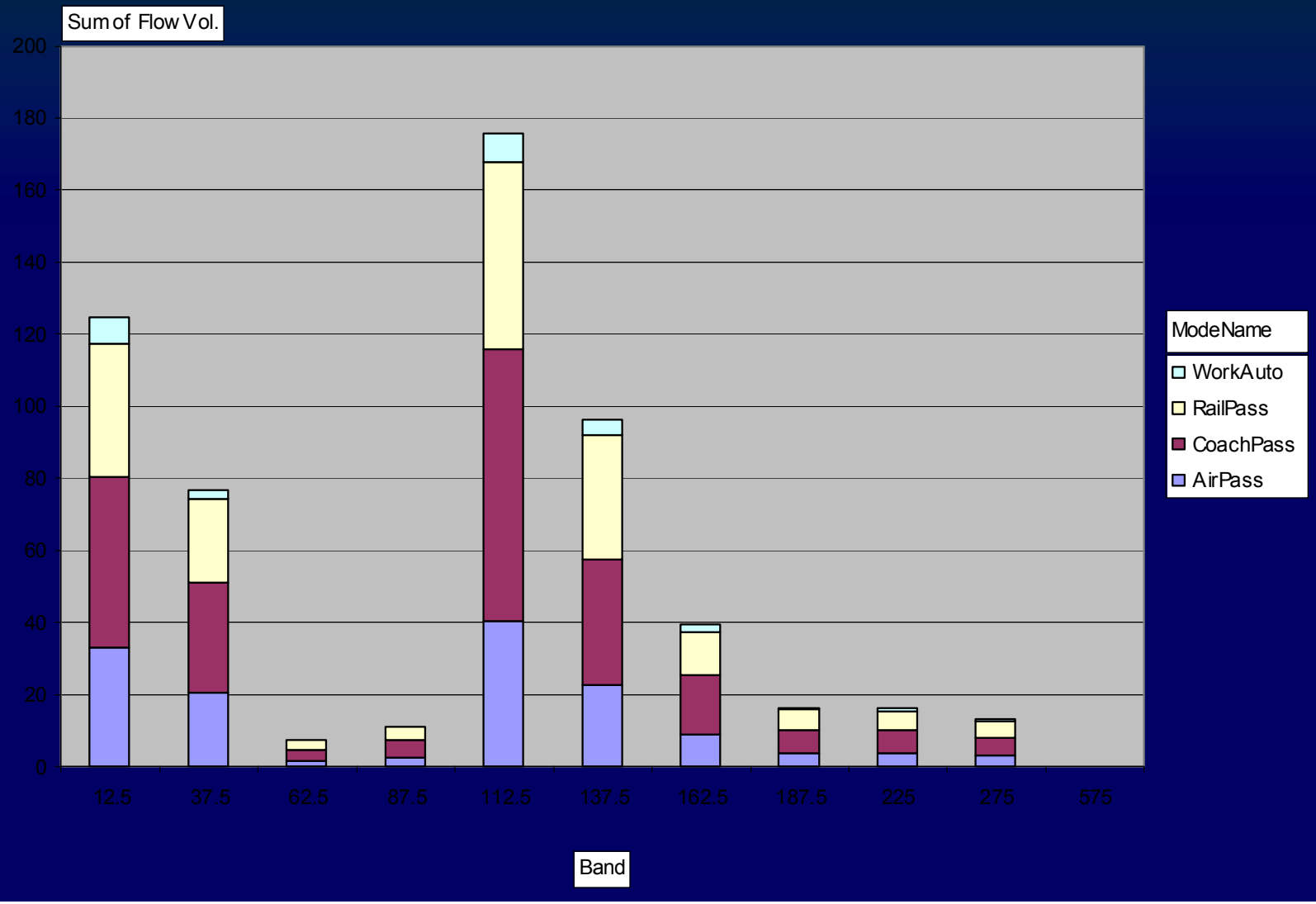
# Mode & Distance of Seattle Business Promo Trips

OrigName | King-Seattle/Shoreline | Flow Name | BizPromo



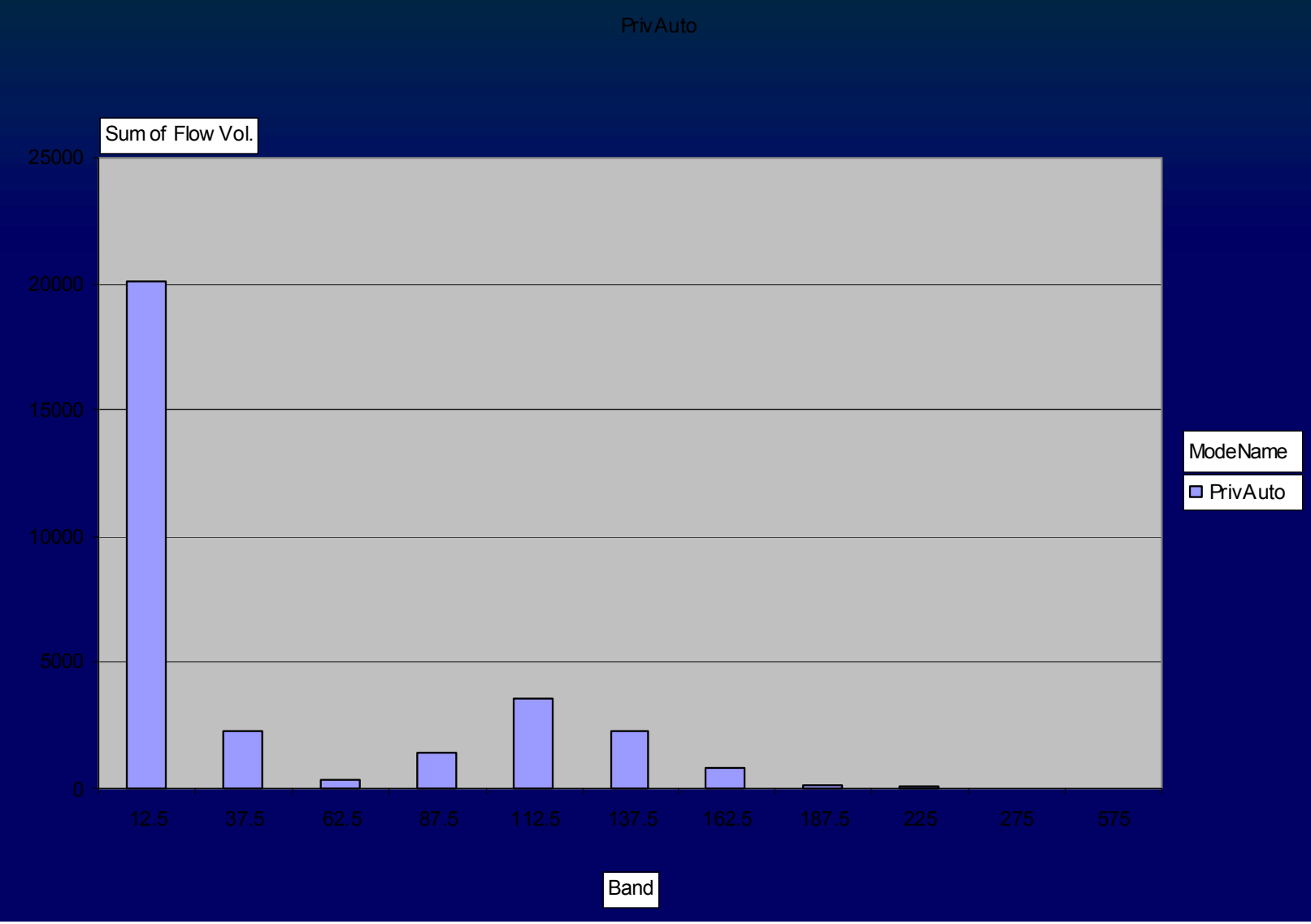
# Mode & Distance of Wenatchee Business Promo Trips

OrigName | Chelan-Wenatchee | Flow Name | BizPromo



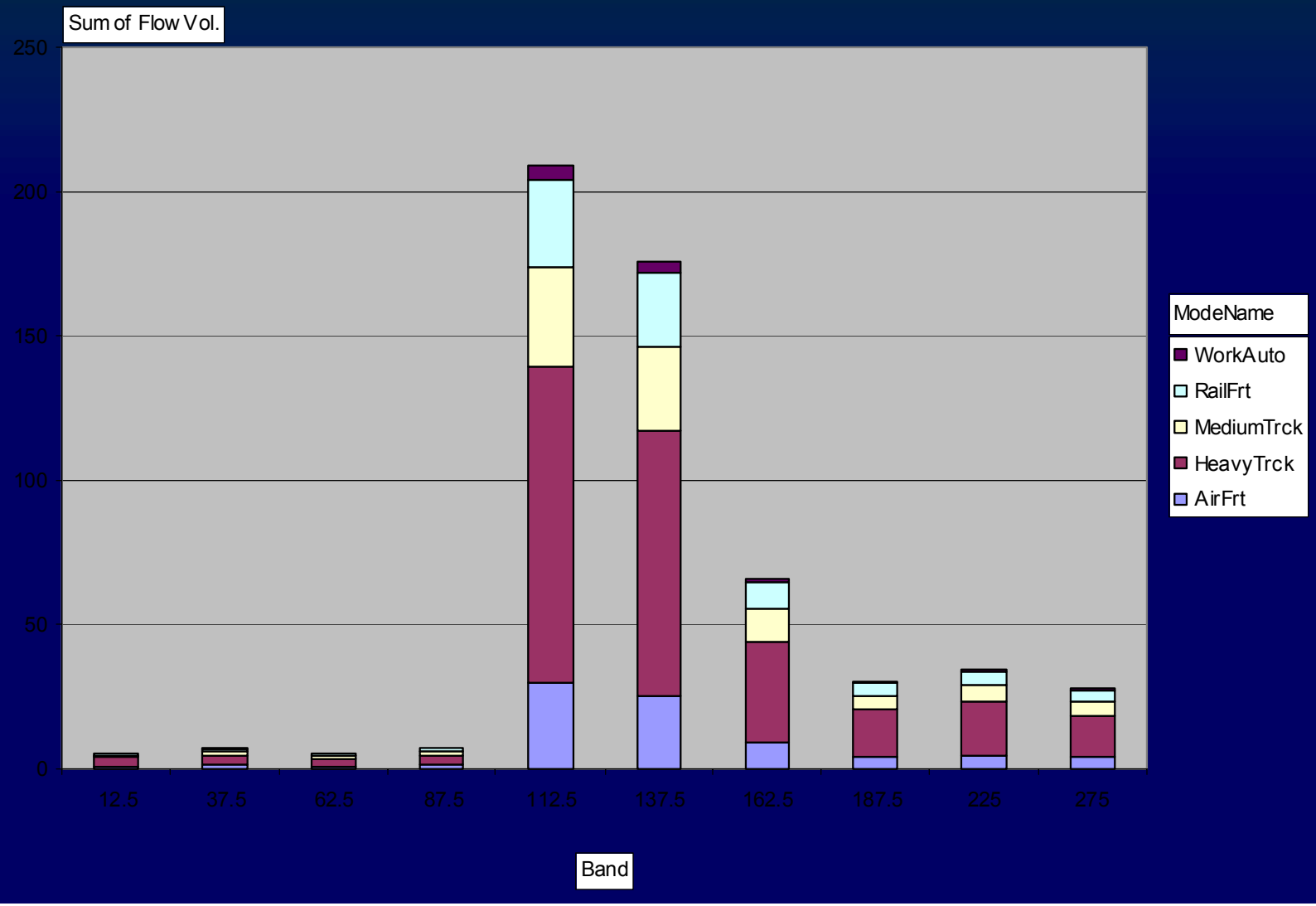
# Mode & Distance of Wenatchee Commuting Trips

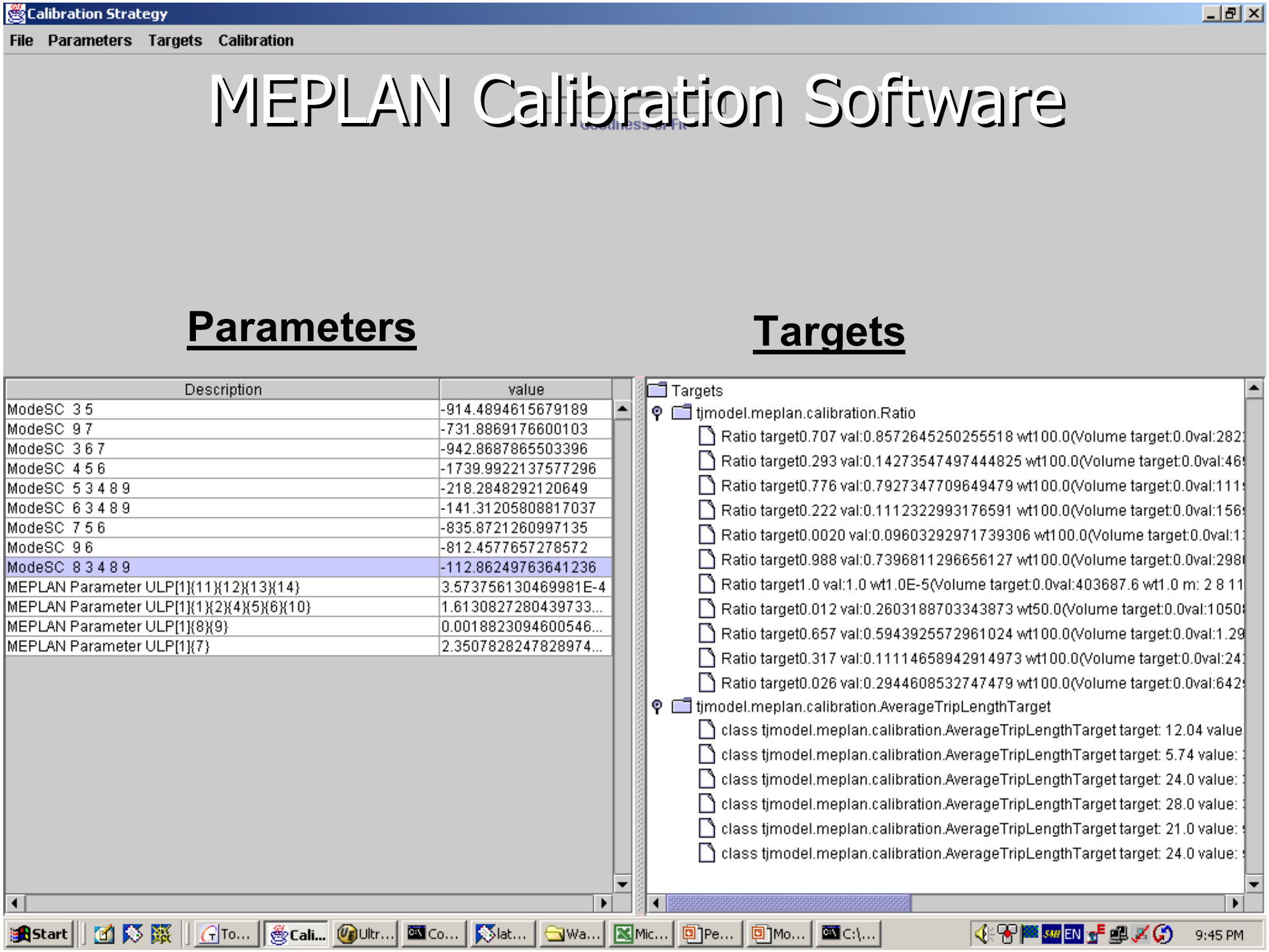
OrigName | Chelan-Wenatchee | Flow Name | Commuting



# Mode & Distance of Wenatchee Mid VtW Freight Trips

OrigName | Chelan-Wenatchee | Flow Name | Mid VTW



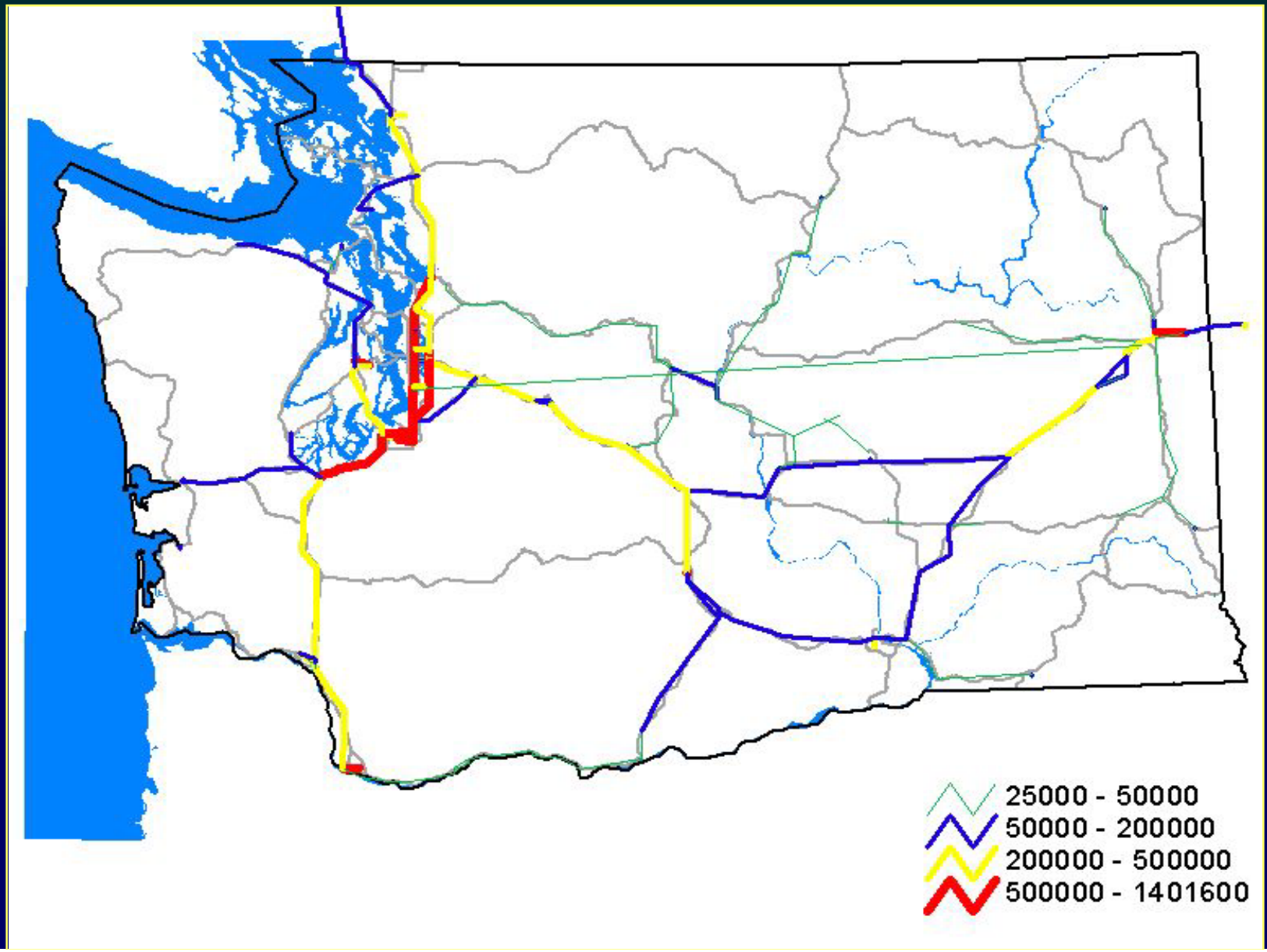

Calibration Strategy
File Parameters Targets Calibration
MEPLAN Calibration Software
Parameters
Targets
Description
value
ModeSC 3 5
-914.4894615679189
ModeSC 9 7
-731.8869176600103
ModeSC 3 6 7
-942.8687865503396
ModeSC 4 5 6
-1739.9922137577296
ModeSC 5 3 4 8 9
-218.2848292120649
ModeSC 6 3 4 8 9
-141.31205808817037
ModeSC 7 5 6
-835.8721260997135
ModeSC 9 6
-812.4577657278572
ModeSC 8 3 4 8 9
-112.86249763641236
MEPLAN Parameter ULP[1]{11}{12}{13}{14}
3.573756130469981E-4
MEPLAN Parameter ULP[1]{1}{2}{4}{5}{6}{10}
1.6130827280439733...
MEPLAN Parameter ULP[1]{8}{9}
0.0018823094600546...
MEPLAN Parameter ULP[1]{7}
2.3507828247828974...
Targets
tjmodel.meplan.calibration.Ratio
Ratio target0.707 val:0.8572645250255518 wt100.0(Volume target:0.0val:282
Ratio target0.293 val:0.14273547497444825 wt100.0(Volume target:0.0val:46
Ratio target0.776 val:0.7927347709649479 wt100.0(Volume target:0.0val:111
Ratio target0.222 val:0.1112322993176591 wt100.0(Volume target:0.0val:156
Ratio target0.0020 val:0.09603292971739306 wt100.0(Volume target:0.0val:1
Ratio target0.988 val:0.7396811296656127 wt100.0(Volume target:0.0val:298
Ratio target1.0 val:1.0 wt1.0E-5(Volume target:0.0val:403687.6 wt1.0 m: 2 8 11
Ratio target0.012 val:0.2603188703343873 wt50.0(Volume target:0.0val:1050
Ratio target0.657 val:0.5943925572961024 wt100.0(Volume target:0.0val:1.29
Ratio target0.317 val:0.1111465894291 4973 wt100.0(Volume target:0.0val:24
Ratio target0.026 val:0.2944608532747479 wt100.0(Volume target:0.0val:642
tjmodel.meplan.calibration.AverageTripLengthTarget
class tjmodel.meplan.calibration.AverageTripLengthTarget target: 12.04 value
class tjmodel.meplan.calibration.AverageTripLengthTarget target: 5.74 value:
class tjmodel.meplan.calibration.AverageTripLengthTarget target: 24.0 value:
class tjmodel.meplan.calibration.AverageTripLengthTarget target: 28.0 value:
class tjmodel.meplan.calibration.AverageTripLengthTarget target: 21.0 value:
class tjmodel.meplan.calibration.AverageTripLengthTarget target: 24.0 value:
Start
9:45 PM

# No Build Output

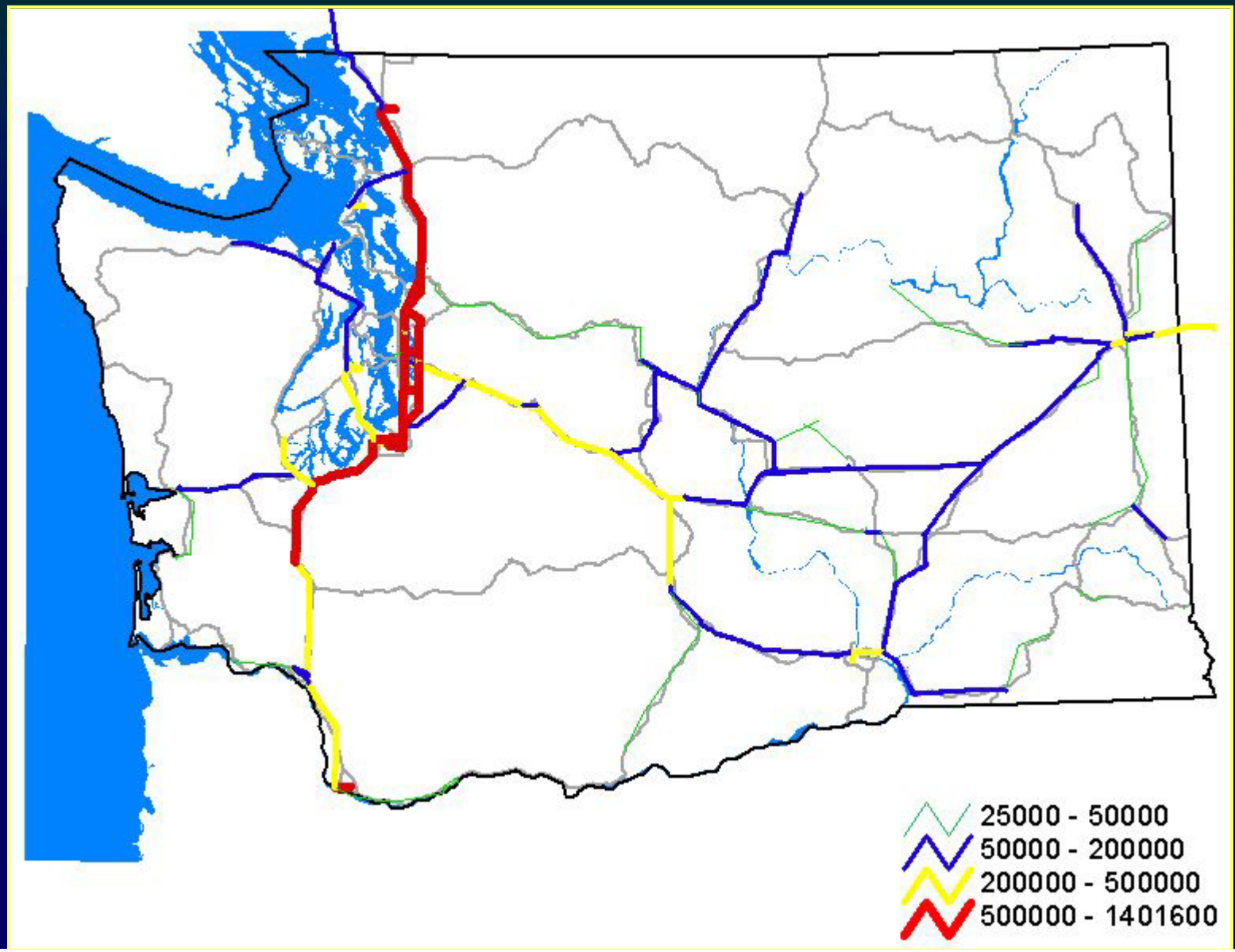
- Average Daily Traffic for the average weekday for the corridor;
- Mode splits between highway, rail, intercity bus and air for the corridor;
- Future household allocation by income group and zone; and
- Future employment allocation by industry and zone; and
- O-D Information (e.g. time, distance, cost by mode)

# Calibration Evaluation

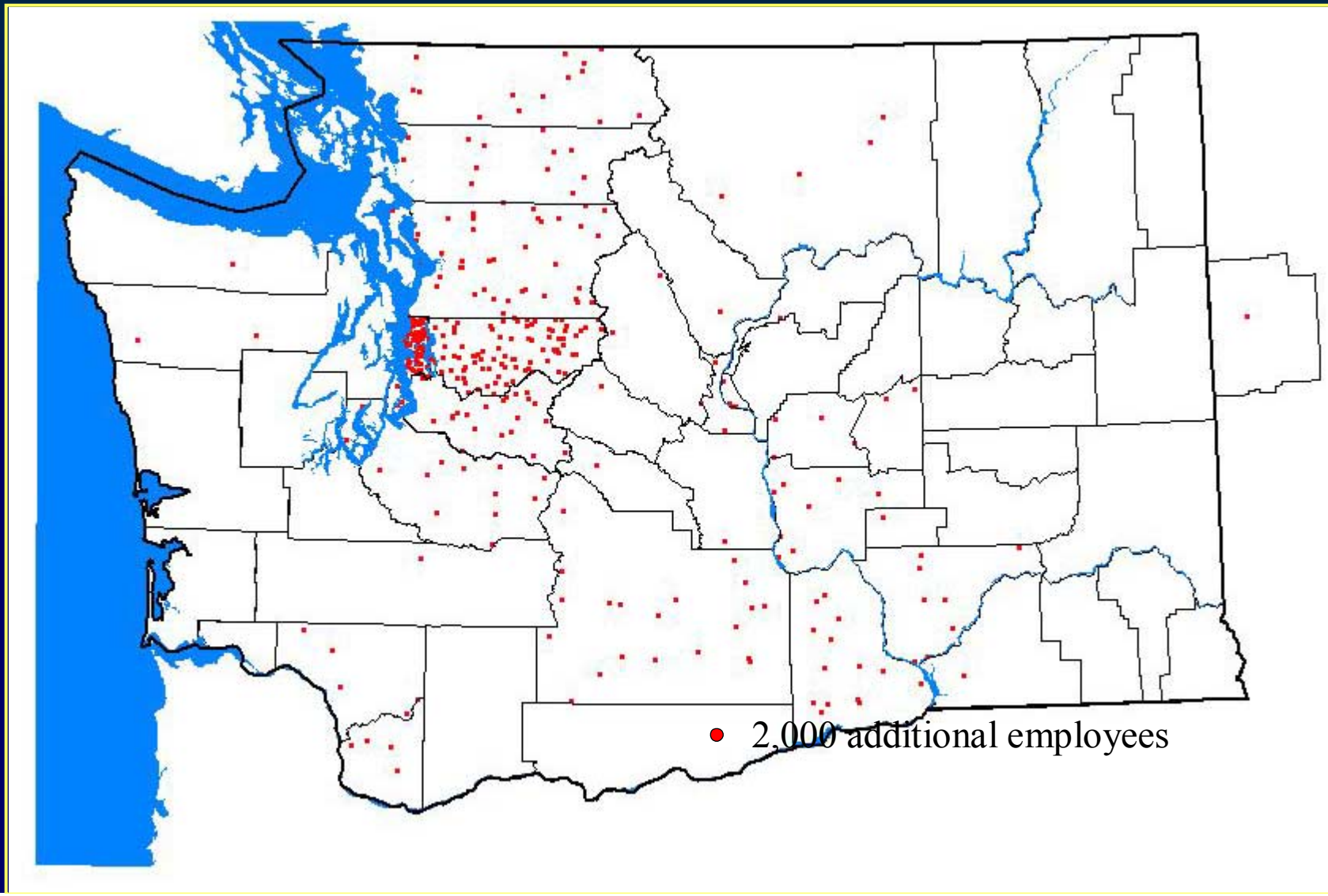
# 1998 Network Loads



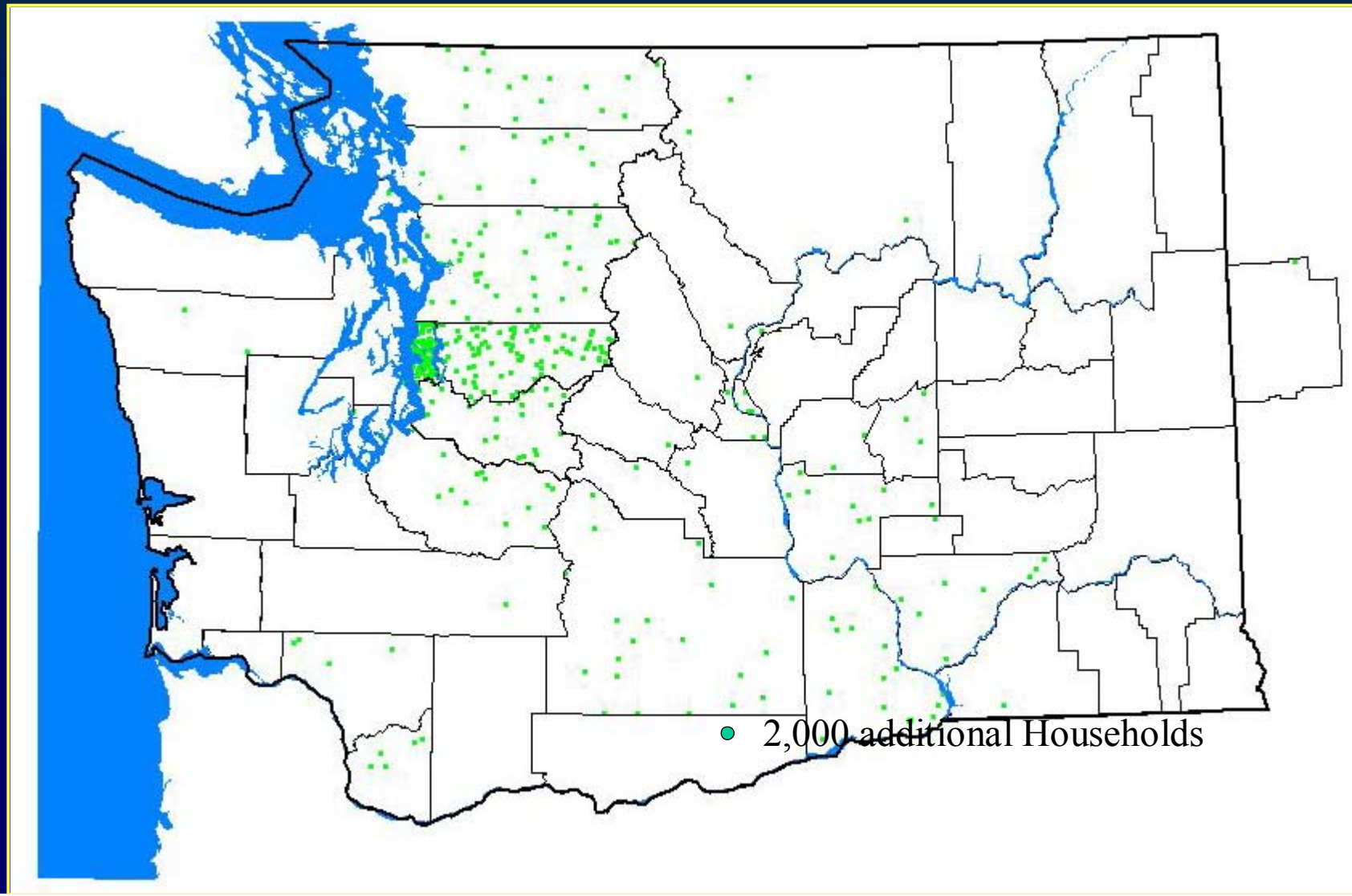
# 2019 Network Loads



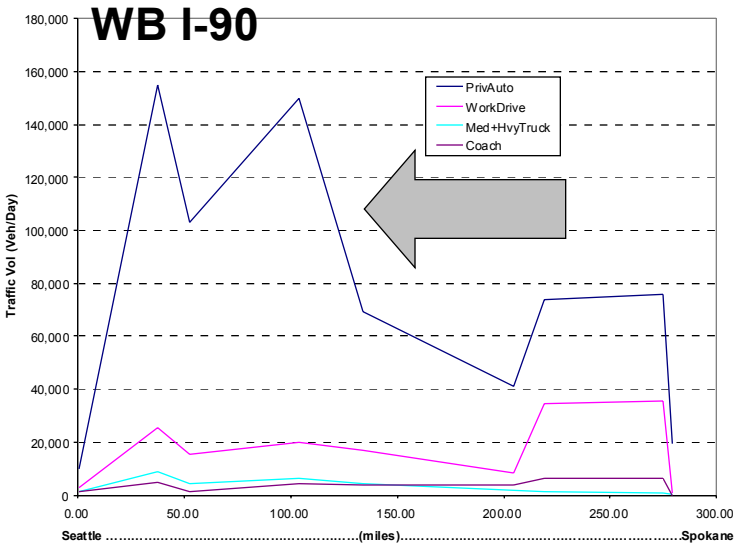
# 1998-2019 Employment Growth

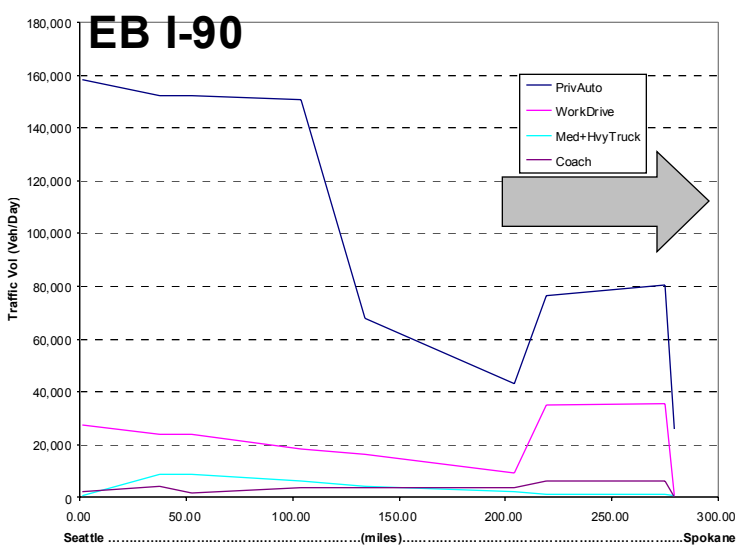


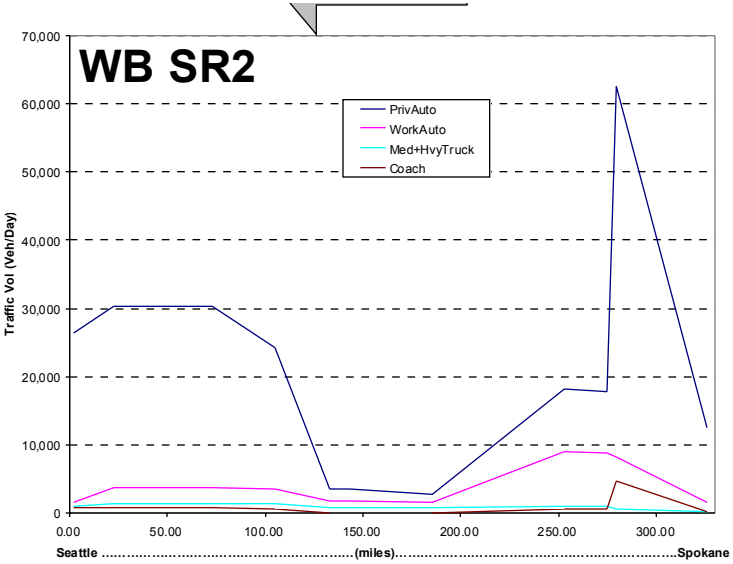
# 1998-2019 Household Growth

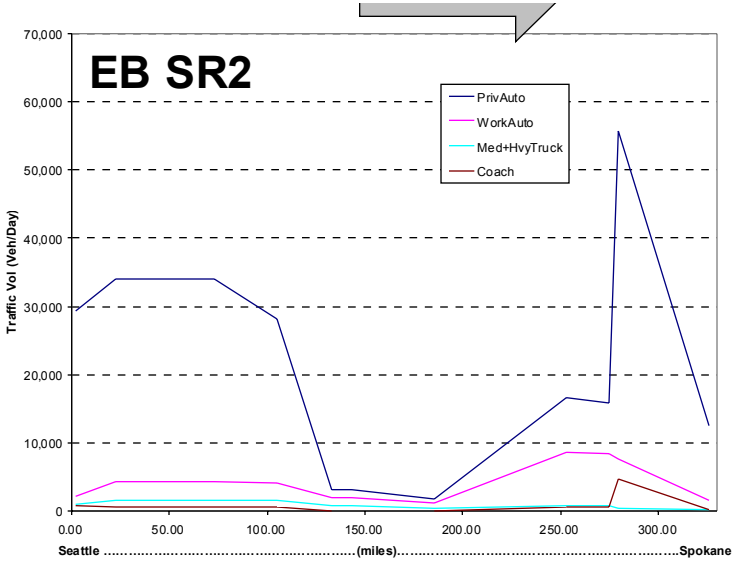


# 1998 Corridor Segment Loads



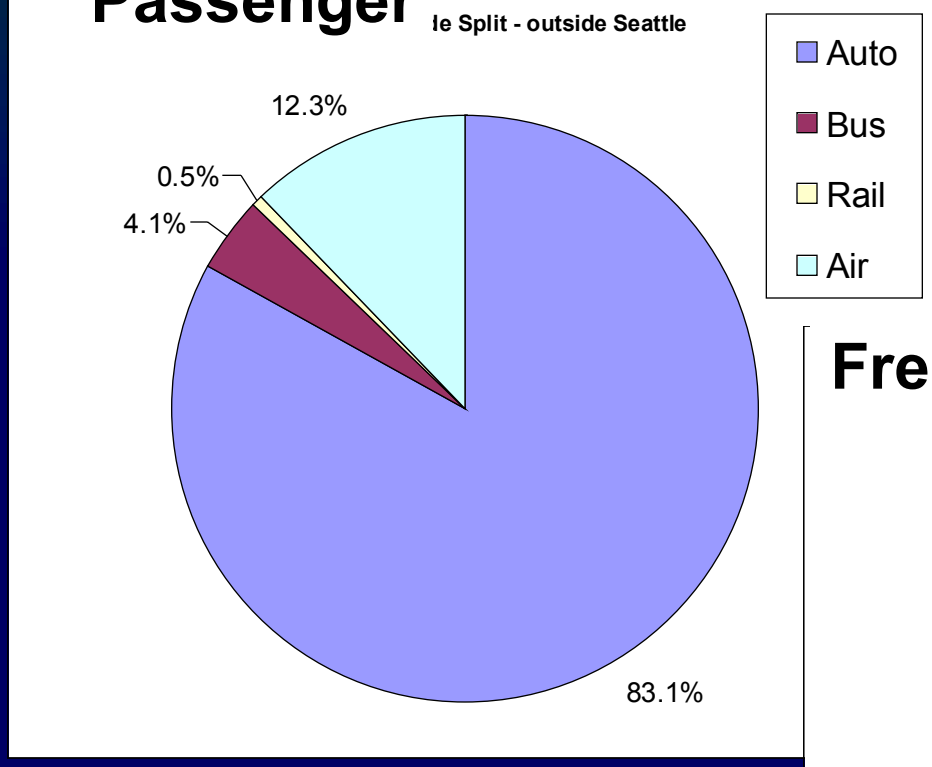



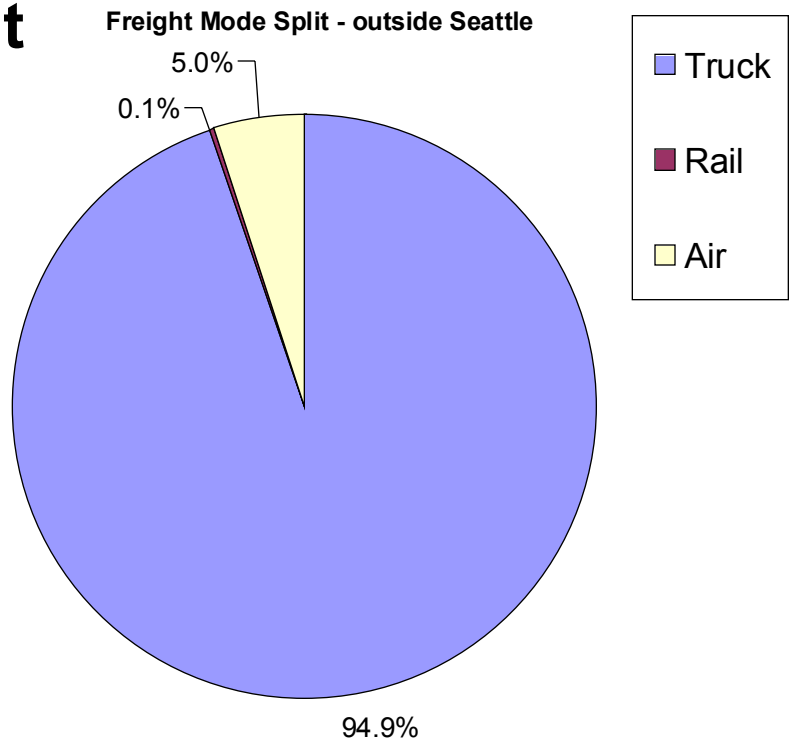



# 1998 Corridor Mode Split (outside Seattle)

## Passenger




## Freight



# Question 2: Calibration and Outputs

- **Do you have any comments on calibration method/process we've just begun?**
- **Do you have any comments on initial model outputs for base year and no-build future years?**

# Question 3: What future scenarios should/can be evaluated with this model by WSDOT?

# Question 3: Scenarios

**What future scenarios should/can be evaluated with this model by WSDOT**

- Planned CCC Project Scenarios
  - No Build (Planned upgrades)
  - Motor Vehicle User Costs – increase or decrease
  - Marked increase in Transit Service (Coach, Amtrak)
  - Significant Economic/Land Use Change
  - Transportation System Improvements
- Future Project Scenarios?

# Question 4: What Should be WSDOT's Next Steps in Development and Expansion of the CCC Model?

# Question 4: Next Steps

- **In your opinion, what steps should the WSDOT take in further developing and expanding the CCC Model?**
  - Changes to model structure
  - Changes to data sources/targets
  - Changes to economic/operational assumptions
  - Other
- **Please identify a prioritized list of the next steps that should be taken with this model?**
- **Does your answer/priority change if the next application is the I-5 Corridor?**

# Open Forum Discussion